Web-Based Software Simulations: Training Tools with a Diagnostic Flavor

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The Mission Execution and Automation Section, Information Technologies and Software Systems Division at JPL (Jet Propulsion Laboratory,) is currently developing software simulation training for delivery over the internet. Increased demand from an international community of flight and ground systems engineers has created a demand for timely training that can be satisfied, or augmented, by on-line delivery.

Animated training modules (Flash movies for this usage) with the look and feel of real mission software are invoked and executed from customer-owned computers using an internet browser. This offers a safe environment in which to practice, while allowing users to learn at a comfortable, convenient pace any time of the day or night. A user can execute the simulations while operating actual software on a nearby computer, or possibly in another window on the same computer. This is especially helpful for discovering problem areas and answering procedural questions that arise during actual run time.

New users can follow prescribed scenario sequences, while experienced users can navigate to a point of concern and test options; instructions and annotations accompany every screen, and often each individual widget. The operator selects the desired option per descriptions provided and the system presents the sequence of responses appropriate to each selection, as it would during a real operation.

In addition to initiating new operators and tracking down problems, animated movies provide easy refresher courses for those not actively engaged in day-to-day operations. When knowledge and skills are not used regularly, they are lost. Flash movies provide an enjoyable way to interact with the software on a regular basis.

Mission software requires a significant amount of background knowledge and an intuitive sense of timing. Subsystems are driven primarily by an intricate structure of graphical user interfaces (GUIs) for which large numbers of engineers must be trained at initial release. Movies are a great resource to speed the training process and help ease the training load.

GUI simulations are especially useful when they provide a realistic sense of purpose. Our movies are based on actual graphics from the user interfaces and pop-up windows generated during live program operation. They interactively operate per user selection and perform operational sequences as captured by the original programs. Movie response is immediate and users can select any available button or pull-down menu option at any time according to need.

Most aspects of program operation can be exercised by on-line simulations, even nested applications. Movies are easily modified and maintained, and development is relatively low cost. Cost savings are expected over time, especially when travel costs are reduced or eliminated.

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